

WHAT WE CLAIM IS:

1. A product ejecting apparatus for an injection molding machine, said apparatus comprising:

a first drive unit;

a first transmission unit connected to said first drive unit, wherein a rotation of said first drive unit results in a rotation of said first transmission unit;

a second drive unit;

a second transmission unit connected to said second drive unit, wherein a rotation of said second drive unit causes a rotation of said second transmission unit;

an ejector pin configured to reciprocate based upon a motion of said first transmission unit; and

a working member connected to said second transmission unit, wherein a movement of said second transmission unit results in reciprocating movement of said working member.

2. A product ejecting apparatus as recited in claim 1, wherein said first transmission unit and said first drive unit are configured such that rotation of said first drive unit results in rotation and reciprocation of said first transmission unit.

3. A product ejecting apparatus as recited in claim 2, wherein said second transmission unit is configured such that rotation of said second drive unit results in rotation and reciprocation of said second

transmission unit.

4. A product ejecting apparatus as recited in claim 1, wherein said first and second transmission units comprise a motion conversion unit.

5. A product ejecting apparatus as recited in claim 1, wherein a reciprocating movement of said ejector pin and a reciprocating movement of said working member are in a same direction.

6. A product ejecting apparatus as recited in claim 1, further comprising a movement restriction unit for restricting axial movement of the first transmission unit.

7. A product ejecting apparatus as recited in claim 6, wherein said movement restricting unit comprises a stopper.

8. A product ejecting apparatus as recited in claim 1, further comprising a movement restricting unit for restricting axial movement of said second transmission unit.

9. A product ejecting apparatus as recited in claim 8, wherein said movement restricting unit comprises brakes.

10. A product ejecting apparatus as recited in claim 8, wherein

said movement restricting unit comprises at least one spring.

11. A product ejecting apparatus as recited in claim 1, further comprising:

a first drive control unit for controlling said first drive unit; and

a second drive control unit for controlling said second drive unit,

wherein said first drive control unit and said second drive control unit are configured such that when said first drive control unit drives said first drive unit, said second drive unit is maintained in a fixed rotational position.

12. A product ejecting apparatus as recited in claim 11, wherein said first drive control unit and said second drive control unit are configured such that when said second drive control unit drives said second drive unit, said first drive unit is maintained in a fixed rotational position.

~~13.~~ A method for ejecting a product in an injection molding machine, said method comprising the steps of:

first controlling a first drive unit to rotate and reciprocate a first transmission unit;

second controlling a second drive unit so as to cause a second transmission unit to rotate and reciprocate;

reciprocating an ejector pin through a reciprocating motion of the first transmission unit;

reciprocating a working member through a reciprocating motion of the second transmission unit.

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14. A method as recited in claim 13, wherein said controlling of said first drive unit and said second drive unit converts rotational motion of the first and second drive units to linear motion through the first and second transmission units.

15. A product ejecting apparatus, said apparatus comprising:  
a first drive means for providing drive power for an injection molding machine;

a first transmission means connected to said first drive means, wherein a rotation of said first drive means results in a rotation of said first transmission means, said first transmission means for transmitting power from said first drive means;

a second drive means for providing drive power;

a second transmission means connected to said second drive means, wherein a rotation of said second drive means causes a rotation of said second transmission means;

ejection means configured to reciprocate based upon a motion of said first transmission means; and

a working member connected to said second transmission means, wherein a movement of said second transmission means results in

reciprocating movement of said working member.

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16. A product ejecting apparatus as recited in claim 15, wherein said first transmission means and said first drive means are configured such that rotation of said first drive means results in rotation and reciprocation of said first transmission means.

17. A product ejecting apparatus as recited in claim 16, wherein said second transmission means is configured such that rotation of said second drive means results in rotation and reciprocation of said second transmission means.

18. A product ejecting apparatus as recited in claim 15, wherein said first transmissison means and said second transmission means comprise motion conversion means for converting motion.

19. A product ejecting apparatus as recited in claim 15, wherein a reciprocating movement of said ejection means and a reciprocating movement of said working member are in a same direction.

20. A product ejecting apparatus as recited in claim 15, further comprising movement restriction means for restricting axial movement of the first transmission means.

21. A product ejecting apparatus as recited in claim 20,

wherein said movement restricting means comprises stopper means for stopping movement of said first transmission means.

22. A product ejecting apparatus as recited in claim 15, further comprising movement restricting means for restricting axial movement of said second transmission means.

23. A product ejecting apparatus as recited in claim 22, wherein said movement restricting means comprises brake means for restricting movement of said second transmission means.

24. A product ejecting apparatus as recited in claim 22, wherein said movement restricting means comprises spring means for restricting movement of said second transmission means.

25. A product ejecting apparatus as recited in claim 15, further comprising:

first drive control means for controlling said first drive means; and

second drive control means for controlling said second drive means,

wherein said first drive control means and said second drive control means are configured such that when said first drive control means drives said first drive means, said second drive means is maintained in a fixed rotational position.

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